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10/084,336	02/28/2002	Dieter Kerner	032301.606	5608

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EXAMINER
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ZIMMER, MARC S

ART UNIT	PAPER NUMBER
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1796

MAIL DATE	DELIVERY MODE
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07/22/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/084,336	Applicant(s) KERNER ET AL.	
	Examiner MARC S. ZIMMER	Art Unit 1796	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 7, 8 and 15-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 7, 8 and 15-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

The rejection over Hemme is hereby withdrawn. The Examiner has reconsidered in light of the role of the doped titanium oxide as a photocatalyst and tends to agree that treatment with an organosilicon compound may deleteriously impact its activity. A quick survey of the prior art did not yield any references where a similar photocatalyst was silanized (though their presence in coating formulations where a polymer binder was present were not apparently prevelant).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mangold et al., JP 2000-169132 in view of the teachings taken from Chapter 6 of the volume entitled *Handbook of Fillers*, 2<sup>nd</sup> Edition authored/edited by Wypych, Herzig, U.S. Patent # 4,101,499, Penneck, U.S. Patent # 4,001,128, and Cyprien Guy et al., U.S. Patent # 4,886,661 for the reasons espoused previously. See, for instance, the Examiner's August 25, 2006 correspondence.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mangold et al., JP 2000-169132 in view of the teachings taken from Chapter 6 of the volume entitled *Handbook of Fillers*, 2<sup>nd</sup> Edition authored/edited by Wypych, Herzig, U.S. Patent # 4,101,499, Penneck, U.S. Patent # 4,001,128, and Cyprien Guy et al., U.S. Patent #

4,886,661 as applied to claim 15 and, further in view of Labarre, U.S. Patent # 5,718,907.

Some of Applicants' remarks seemed to reflect that none of the cited prior art even taught the claimed permutations of the organosilicon treating agent thus prompting the Examiner to review once more the teachings of Wypych, Herzig, Penneck, and Cyprien-Guy whereupon it was discovered that all of these appeared to be devoid of any mention of octyltrimethoxysilane. Instead, they mention treating agents such as diorganosiloxane oligomers and hexamethyldisilazane.

Labarre teaches a method for preparing organically-modified metal oxide particles wherein it is indicated that some of the convention treating agents such as hexamethyldisilazane may be problematic insofar as its hydrolysis products are susceptible to self-condensation (thereby leading to inefficient and incomplete treatment of the oxide surfaces). See column 3, lines 5-8. It is recommended that organosilicon compounds that exhibit more moderate reactivity, such as octyltrimethoxysilane be used instead of HMDS and other conventional, highly reactive treating agents. See column 3, lines 1-19.

As an aside, Labarre is yet **another** disclosure that documents the even dispersion benefit of iorganic oxide treatment. See column 1.

Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangold et al., JP 2000-169132 in view of the teachings taken from Chapter 6 of the volume entitled *Handbook of Fillers*, 2<sup>nd</sup> Edition authored/edited by Wypych, Herzig, U.S. Patent # 4,101,499, Penneck, U.S. Patent # 4,001,128, and Cyprien Guy et al.,

U.S. Patent # 4,886,661 as applied to claims 8 and 15 above and also in view of Lentz, U.S. Patent # 3,122,520, and Barthel et al, U.S. Patent # 5,851,715 and/or Kennan et al., U.S. Patent # 5,008,305 for the reasons outlined in the March 16, 2010 correspondence.

Claims 8, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangold et al. (US Pat. 6,328,944) in view of the teachings taken from Chapter 6 of the volume entitled *Handbook of Fillers, 2<sup>nd</sup> Edition* authored/edited by Wypych, Herzig, U.S. Patent # 4,101,499, Penneck, U.S. Patent # 4,001,128, and Cyprien Guy et al., U.S. Patent # 4,886,661 for the reasons outlined in the December 23, 2009 Office communication.

Claims 7, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangold et al. (US Pat. 6,328,944), Chapter 6 of the volume entitled *Handbook of Fillers, 2<sup>nd</sup> Edition* authored/edited by Wypych, Herzig, U.S. Patent # 4,101,499, Penneck, U.S. Patent # 4,001,128, and Cyprien Guy et al., U.S. Patent # 4,886,661 as applied to claims 8, 15, and 17 above, and also in view of Lentz, U.S. Patent # 3,122,520, and Barthel et al, U.S. Patent # 5,851,715 and/or Kennan et al., U.S. Patent # 5,008,305 for the reasons outlined in the March 16, 2010 correspondence.

### ***Response to Arguments***

At the outset, the Examiner wishes to emphasize that he vehemently disagrees with any assertion that the skilled artisan is not motivated to modify the doped metal oxides of Mangold to the extent that it is preferred that they be hydrophilic when

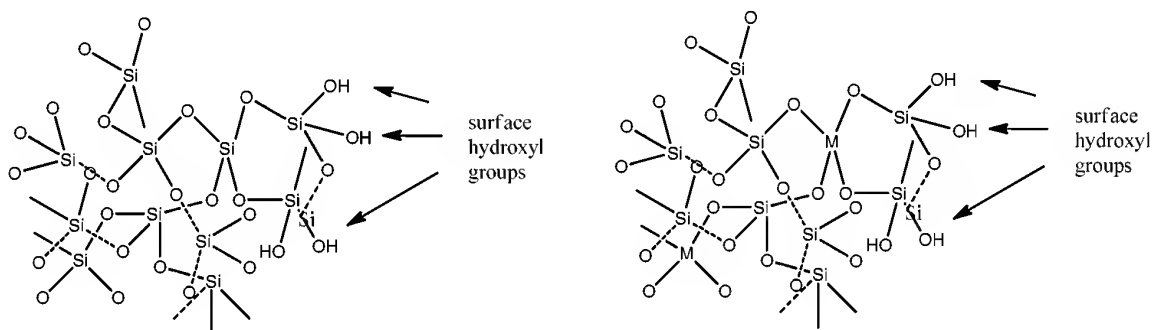
implemented in a primary application of the prior art invention. "A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including nonpreferred embodiments." *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied*, 493 U.S. 975 (1989). In this connection, the incorporation of the doped metal oxide particles into polymer hosts might be regarded as a non-preferred "embodiment", or use, of said particles (more accurately, this application is just given less emphasis and it is not true that it is a non-preferred use) but this is of no consequence whatsoever.

As for the idea that there is no indication in Mangold that silanization of the metal oxide is somehow advantageous, this is precisely why the Examiner saw fit to introduce the supporting references. "The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art." See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). "Obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art." See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007).

When making an initial patentability determination on Applicants' claimed invention, the Examiner first sought disclosures teaching doped metal oxides like those that were claimed. The Examiner's strategy was to locate earlier teachings of the doped metal oxides and determine in what capacity they were being used. In doing so, the Examiner encountered the Hemme patent and both Mangold disclosures. Upon reviewing the content of these disclosures, it was discovered that each of them identified the incorporation of an equivalent doped metal oxide into a polymer. Because the Examiner has been for some time assessing the patentability of applications in the polymer compositions art, it was immediately appreciated that, in those instances wherein the aforementioned oxide materials would be blended into a polymer, their treatment with organosilicon compounds would be beneficial given the well-documented incompatibility between very polar inorganic oxides and comparatively less polar polymer hosts and, thus proceeded to find references that not only taught the silanes of interest but also explained the advantages of oxide particle surface modification. All of the other references aside from Mangold are cited to establish that this was, "knowledge generally available to one of ordinary skill in the art." Moreover, the references cited herein represent a tiny fraction of those that advocate treatment of oxide fillers, and for similar reasons. It was absolutely not the case that the Examiner needed to rely on Applicants' Specification as a blueprint from which to arrive at the instant invention using hindsight construction.

Another argument that Applicant has presented repeatedly is that, whereas the supporting references all disclose the treatment of silica, the oxide particles of the

present invention are instead doped metal oxides. First of all, a favored permutation of the metal oxides that are doped is silica. Additionally, doping essentially means that there exists in the silica framework a small amount of a "foreign" atom that is usually introduced to impart a desired effect not observed with pure silica. Below on the left is depicted a portion of a silica particle. To its right is a metal-doped silica particle:



Notably, both share a silicon-oxygen-silicon continuum with a preponderance of polar hydroxyl groups at their surface. The only distinction between them is that, in the doped particle, some small quantity of the silicon atoms are replaced with one of the metal atoms delineated by the claims. Their structures are otherwise essentially the same and it is, therefore, obvious to the skilled artisan both (i) that each type of particle would suffer the same compatibility issues in a polymer matrix and (ii) addressing the incompatibility issues of the doped silicon oxide could be achieved by treatment with the same surface modification agents.



Concerning the method claims, it was not necessarily the Examiner's intent to include Kobayashi in the statement of rejection. The Examiner states that the conditions for silane treatment outlined in claim 7 are easily identifiable to the skilled artisan as a matter of routine experimentation, particularly since silane modification of oxidic fillers is so widely known. Kobayashi is offered as nothing more than an illustration that one optimizing the reaction conditions for silane modification of an inorganic oxide would arrive at conditions similar to those required by Applicants' claims.

Applicant remarks that the references Barthel, Kennan, and Kobayashi are not helpful as a means of constructing the rejection of the method claims inasmuch as they do not disclose the claimed treating agents. These references were cited to address different aspects of the method. Herzig, Penneck, and Cyprien-Guy are cited as examples of references that teach the claimed treating agents. Applicant is reminded that they have been invited on a plurality of occasions to compare compositions containing oxides treated with these particular organosilicon compounds against those containing treated metal oxides, but wherein the treating agents are instead some of the alternative treating agents contemplated by the prior art. Were Applicant to illustrate, for instance, that compositions containing hexamethydisilazane-treated doped metal oxides had superior properties when compared to those comprising doped metal oxides that have been treated with other conventional organosilicon compounds of the prior art, the Examiner would be inclined to remove the rejection. Applicant has, to this point, not attempted to prove the unobviousness of their invention using this approach.

Applicant then offers a piecemeal analysis of the references employed in the stated rejection of the method claims. There seems to be an implication in Applicants' remarks that the various process limitations of the claims would have to be confined to a single supporting disclosure for the rejection to be appropriate. This is tantamount to arguing the propriety of the rejection on the foundation that too many references were cited. Reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991). In truth, the Examiner has probably cited more references than were absolutely necessary to prove the unobviousness of treating an oxide filler with an organosilicon compound prior to blending it into a polymer. The Examiner has plainly established that each of the manipulations recited in the claims is known and has explained the benefits of the water/acid pretreatment and the exclusion of oxygen.

The Rule 132 Declaration does not establish the criticality of any one or more of the process limitations. There is not, for instance, any demonstration that a filler that is not first treated with water and/or acid prior to reaction with the organosilicon compound exhibits any inferior properties *not predicted by Lentz*. Rather, it simply verifies that organosilicon compound-treated doped metal oxides are more easily incorporated into a polymer and the filled polymer has improved properties over a composition containing an untreated homologue.

***Allowable Subject Matter***

Claims 19 and 20 are allowable.

This Office action has not been made final only because it was deemed necessary to invoke a new reference to address claim 8.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARC S. ZIMMER whose telephone number is (571)272-1096. The examiner can normally be reached on Monday-Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jim Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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July 20, 2010

/Marc S. Zimmer/  
Primary Examiner, Art Unit 1796S